

REMARKS

The present invention is a display device for use in applications such as mobile telephones which require efficient utilization of the display area of the device and for aesthetic reasons are desirably symmetrical. See the discussion in the Field of the Invention.

In accordance with an embodiment of the invention, a display device 10 in accordance with the invention includes a liquid crystal display 11 comprising first and second liquid crystal cells 12 and 13 positioned along a first axis of the display device as illustrated in Figs. 1, 5a, 6a and 6b, a first display driver 14, 251a, and 67 for driving the first liquid crystal cell in a first direction and a second direction; a second display driver 15, 251b and 68 for driving the liquid crystal cell in a first direction and a second direction; and means for synchronizing 16 the first and second display drivers; and wherein the first and second display drivers are positioned at opposite sides of the LCD as illustrated in Figs. 1, 5a, 6a and 6b. This subject matter provides a symmetrical appearance which, as stated above, is important in applications such as mobile telephones where the appearance and display available for the display device is at a premium.

The invention is an improvement of the prior device illustrated in Fig. 8a. The claimed invention pertains in part to display drivers which each drive the liquid crystal cell in a first direction and in a second direction. In contrast, devices of the type illustrated as the prior art in Figure 8b and to which United States Patent 5,841,431 (Simmers) pertains as discussed below use first and second drivers which respectively drive the liquid crystal cells in a first direction and a second direction.

The title of the invention has been amended to be descriptive; further claim 27 has been cancelled and the subject matter of claims 1, 9 and 10 has been written as new independent claim 28 with claim 28 containing the same amendments as to form as have been made in claim 1.

Claims 1 and 20 stand rejected regarding insufficient antecedent basis which has been corrected by this amendment.

Claims 1-19 and 27 stand rejected under 35 U.S.C. §102 as being anticipated by United States Patent 5,841,431 (Simmers). The Examiner reasons as follows:

“Regarding Claims 1 and 27, Simmers teaches a display device comprising: a liquid crystal display (LCD) comprising first and second liquid crystal cells positioned along a first axis of the display device (Fig. 1; Col. 2, line 24- col. 3, line 30); a first display driver (110) for driving the first liquid crystal cell in a first and second direction; a second display driver (115) for driving the second liquid crystal cell in a first and second direction (Fig. 1; Col. 2, line 24- col. 3, line 60); and means for synchronizing the drivers and wherein the first and second display drivers are positioned at opposed sides of the LCD. (Fig. 1; Col. 2, line 24- col. 3, line 65; Fig. 2; col. 4, line 1- col. 5, line 44; Figs. 3-6).”

These grounds of rejection are traversed for the following reasons.

The Examiner has erroneously concluded that Simmers first display driver 110 drives the first liquid crystal cell in a first and a second direction and his second display driver 115 drives the second liquid crystal in a first direction and in a second direction. In fact Simmers illustrates in Figure 1 a display of the type illustrated in Fig. 8b of the present application which has separate display drivers which only drive in a single direction. This is known in the art as a x-y driver. In Figure 1 of Simmers the common drivers 110 and 115 as discussed in column 2, lines 42 et sequence drive the LCD panel 100

in the X direction and the segment drivers 120, 122, 124 and 128 drive the LCD panel in the Y direction.

Claim 1 and similarly claim 28 in part recites:

“A display device comprising:
a liquid crystal display (LCD) comprising first and second liquid crystal cells positioned along a first axis of the display device;
a first display driver for driving the first liquid crystal cell in a first and in a second direction;
a second display driver for driving the second liquid crystal cell in a first direction and in a second direction; and
means for synchronizing the first and second display drivers; and
wherein the first and second display drivers are positioned at opposed sides of the LCD.”

Claims 1 and 28 recite in part a first display driver for driving the first liquid crystal cell in a first direction and in a second direction and a second display driver for driving the second liquid crystal cell in a first direction and in a second direction and the first and second display drivers are positioned at opposed sides of the LCD. As may be seen from Figure 1, the common drivers 110 and 115 and the segment drivers 120, 122, 124 and 126 of Simmers are at adjacent sides and therefore are not at opposed sides. Accordingly, claim 1 and claim 28 is not anticipated.

Moreover, there is no basis in the record, why a person of ordinary skill in the art would be lead to modify the teachings of Simmers to utilize display drivers which each drive in first and second directions and to further position the first and second display drivers at opposed sides of the LCD except by impermissible hindsight.

Claim 28 is narrower than claim 1 in reciting a connector for connecting display device circuitry to an external element, and an intermediate element for interfacing the display device and the connector. It is submitted that this

subject matter is not taught by Simmers. The Examiner has referred to portions of Simmers but he has not identified which he considers to be the connector and intermediate element; and that the intermediate element is located substantially behind the LCD. It is not clear what the Examiner considers the intermediate element to be.

The dependent claims define further aspects of the present invention which are not anticipated by Simmers:

1. Claim 2 requires that the first and second display drivers are positioned at opposed sides of the LCD along the first axis of the display device. This subject matter for the reasons set forth above is not met since Simmers does not have first and second display drivers which drive in a first direction and in a second direction and further does not have drivers positioned along a first axis of the display device.

2. Claims 3-8 define further aspects of the geometry of the display device which is not met by Simmers.

3. Claims 11-14 further recite more specific aspects of the intermediate element. Again, it is not clear what the Examiner considers the intermediate element to be.

4. Claim 15 further limits claim 28 in reciting that the display device further comprises first and second flexible driver supports for supporting the respective first and second drivers. The subject matter of claim 15 is not anticipated for the reasons that Simmers does not disclose the first and second drivers. Furthermore it is not understood what the Examiner considers the flexible driver supports to be, which are stated to be FPC foils, since FPC foils are not illustrated in the drawings and do not appear to be

described in the places where the Examiner has indicated they may be found in the disclosure of Simmers.

In view of the foregoing remarks it is submitted that each of the claims in the application is in condition for allowance. Accordingly, early allowance thereof is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Case No. 367.40909X00) and please credit any excess fees to such deposit account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Donald E. Stout", is written over a horizontal line.

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Attachments